GENDER DIFFERENCES IN HIV RISK BEHAVIORS IN AN ADULT EMERGENCY DEPARTMENT IN NEW YORK CITY

JONATHAN SHUTER, MD, PETER L. ALPERT, MD, MAX G. DESHAW, MD, BARBARA GREENBERG, PHD, CHEE JEN CHANG, PHD, AND ROBERT S. KLEIN, MD

ABSTRACT

Background. The human immunodeficiency virus (HIV) epidemic in the US increasingly involves urban heterosexual adults, particularly women, belonging to ethnic minority groups. An understanding of gender-based differences in HIV risk behaviors within these groups would be of value in the ongoing struggle to limit HIV transmission in metropolitan centers.

Methods. This was a prospective study of demographic and historical characteristics and HIV risk behaviors. The study utilized a structured interview format, which was administered to all patients treated by participating emergency department physicians.

Results. On univariate analysis of data obtained from 1,460 patients who had neither a known HIV infection nor a chief complaint or final emergency department diagnosis associated with HIV risk behaviors, men were more likely to be older, homeless, to have ever injected drugs, used crack, engaged in same-gender sex, paid for sex, been incarcerated, or had syphilis or gonorrhea. Women were more likely to report prior chlamydia infection or to report that their sole sex partners had other partners within the past year. On multivariate analysis, variables independently associated with male gender included homelessness, injection drug use, crack use, any prior sexually transmitted disease (in subjects

---

Drs. Shuter, Alpert, DeShaw, and Klein are from the Division of Infectious Diseases, Department of Medicine, Montefiore Medical Center; Drs. Shuter and Alpert are from the North Central Bronx Hospital; Drs. Greenberg, Chang, and Klein are from the Department of Epidemiology and Social Medicine, Montefiore Medical Center; and from the Department of Medicine and the Department of Epidemiology and Social Medicine, Albert Einstein College of Medicine, Bronx, New York.

Reprints and correspondence: Jonathan Shuter, MD, Department of Medicine, Office 3N-1, Jacobi Medical Center, 1400 Pelham Parkway South, Bronx, NY 10461.

This work was supported in part by a collaborative agreement with the Centers for Disease Control and Prevention (U64/CCU200714). Drs. Shuter, Alpert, and DeShaw were supported in part by a training grant (5-T32-AI070183) from the National Institute of Allergy and Infectious Diseases. This study was presented in part at the 32nd Annual Meeting of the Infectious Diseases Society of America, October 1994, Orlando, Florida.

35 years of age or older), and sex with prostitutes. In a separate analysis of patients admitting to drug use, the male predominance of other risk behaviors was not observed; the only significant differences between genders were a higher rate of prostitution among women and a higher rate of sexual contact with a prostitute among men.

Conclusions. In patients visiting an inner-city emergency department in the Bronx, HIV risk behaviors are generally more common in men, but rates of risk behaviors among male and female drug users are comparable.

INTRODUCTION

Numerous studies have explored gender differences in human immunodeficiency virus (HIV) risk behaviors in the US. Early in the epidemic, when the majority of AIDS cases occurred in men who engaged in same-gender sex or injection drug use, epidemiologic studies, clinical trials, and public health initiatives focused mainly on men. In recent years, with recognition of the growing involvement of women in the HIV epidemic, much has been learned of the different drug use and sexual risk behavior patterns of females. Cases of HIV infection are increasing among women at a faster rate than among men in this country,[1] with a particular predilection for women of color in urban centers.[2] A recent analysis of national HIV prevalence statistics estimated that approximately one-quarter of heterosexually transmitted HIV infections are occurring in the New York City area, and that the majority of these cases occur in females.[3]

Educational efforts and modification of risk behaviors have been public health priorities, particularly in areas where HIV infection rates are high. A recent overview of such programs released from the US Public Health Service lists as a top priority achieving "a thorough understanding of the target population."[4] Studies of gender differences in HIV risk behaviors have been restricted largely to random surveys of the general population that have enrolled only cooperative individuals who have households and/or telephones[5–7] and surveys of drug users[8–11] or visitors to clinics for sexually transmitted diseases[12,13] who have risk behavior profiles that differ dramatically from the general population.

We undertook a study of gender differences in risk behaviors among adult patients in a medical emergency department in the Bronx, New York City. The Bronx is an epicenter of HIV disease, with a cumulative acquired immunodeficiency syndrome (AIDS) case rate of 1.3% among adults in 1994, and the Bronx has the highest incidence of adult female AIDS cases of the city's five boroughs.[14]

METHODS

Between April 1, 1993, and April 1, 1994, a standardized interview was administered to consecutive patients evaluated by the authors in the adult medical noncritical area of the North Central Bronx Hospital Emergency Department.

The investigators were functioning as emergency department physicians, and the interviews were incorporated into the routine patient histories, consistent with appropriate clinical care, without a separate informed consent process. A full description of patient enrollment, data collection, data management, and factors associated with HIV infection and prior HIV testing have been reported previously.[15,16] The present report includes analyses of gender differences in HIV risk behaviors. Because the emergency department is commonly used by patients with known HIV infection and by patients with drug intoxication and symptoms of sexually transmitted diseases, analyses excluded all patients with chief complaints or final emergency department diagnoses of drug intoxication or a sexually transmitted disease (including HIV infection) to produce a sample that was not preselected for HIV risk behaviors by virtue of their visit. Data on the demographics of all patients evaluated in the medical emergency department during the study period were provided from the database of the management information system of the hospital. Univariate analyses and comparisons of means were performed using the EpiInfo 6.0 computer package (CDC, Atlanta, Ga). Results were considered significant at $P \leq .05$.

Multivariate logistic regression[17] was used to evaluate whether gender was associated independently with each selected HIV risk behavior and historical factor after controlling for the effects of significant covariates. Modeling was accomplished by backward stepwise regression beginning with all variables found to be significant on univariate analyses. Race/ethnicity was included in the complete model for each outcome behavior evaluated.

Variables selected for the final model were based on the likelihood ratio statistic (LRS), that is, twice the change in the log of the likelihood. The criterion for inclusion of a variable in the model was an LRS with a significant chi square for the corresponding degrees of freedom (e.g., ≥3.8 for 1 *df*). The importance of each variable included in the final model was verified by examination of the Wald statistic and by a comparison of each estimated coefficient with the coefficient from the univariate analysis containing only that variable. Variables that did not contribute to the model based on this criterion were eliminated, and a new model was fit. Coefficients in the new model were compared to those in the previous model. Any variable that resulted in a 10% or greater change in the magnitude of the remaining coefficients was retained to adjust for the effects of that variable. Interaction effects were evaluated based on the LRS. Data analysis was performed using SAS (SAS Institute, Inc., Cary, NC). The adjusted odds ratios (OR_{adj}) are presented with the corresponding 95% confidence intervals (CIs).

The study was approved by the institutional review boards of Montefiore Medical Center and the Health and Hospitals Corporation of New York City.

RESULTS

The study population consisted of 1,744 patients. Of the interviews, 4% were not completed because of patient refusal or inability to answer questions. Females comprised 65.6% of the sample; 52.7% of patients were of Hispanic ethnicity, 23.9% were African-American, and 6.1% were white. The study sample was similar to all patients seen in the medical emergency department during the study period with respect to gender (65.6% vs. 61.4% female, respectively), age (mean ± SD, 34.6 ± 13.5 vs. 36.6 ± 14.6), race and ethnic background (white 7.7% vs. 7.5%, black 30.5% vs. 32.1%, and Hispanic 53.7% vs. 56.2%), and insurance status (Medicaid 50.0% vs. 50.0%, Medicare 3.1% vs. 7.1%, private 9.9% vs. 7.1%, and none 3.1% vs. 3.2%). After exclusion of 284 patients with prior knowledge of HIV infection or an emergency department presentation consistent with drug intoxication or sexually transmitted disease, 1,460 patients remained for analysis.

A comparison of demographic characteristics, reported HIV risk behaviors, and history of sexually transmitted diseases according to gender is provided in Table I. On univariate analysis, female patients were significantly less likely to be white, uninsured, married, and homeless, or to have had a history of incarceration. Women were significantly younger than men. Men were more likely to have used injection drugs or crack and were more likely to report a history of same-gender sex or sex with a prostitute and having been diagnosed in the past with gonorrhea or syphilis. Men reported a significantly higher mean number of sexual partners in the 12 months preceding the interview. Women reported a higher rate of prior chlamydia infection, and among the subset of patients who claimed to be monogamous for the past 12 months, females were more likely to report that their one partner had at least one other sexual partner within the past 12 months. When analysis was restricted to those patients who reported a history of injection drug or crack use, differences in risk behaviors between men and women diminished. Only sex with a prostitute remained significantly more common among men. Age, marital status, lack of insurance, history of sexually transmitted diseases, and all other sexual behaviors no longer differed significantly by gender, with the exception of prostitution, which was more common among women (for men, OR = 0.20, 95% CI 0.06–0.62). In comparison to the overall study population, African-Americans were significantly over-represented ($P < .001$ for each gender) among subjects with a history of drug use, comprising 37.5% and 69.2% of the sample of males and females, respectively, who used

TABLE 1 Historical/Demographic Factors and HIV Risk Behaviors by Gender

Historical/Demographic Factor or Risk Behavior*	Female (N = 973)	Male (N = 487)	OR (95% CI) for Females	*P*
Ethnic background:				
African-American	229/969 (23.6%)	98/481 (20.4%)	1.20 (0.92–1.59)	.16
Hispanic	416/969 (42.9%)	193/481 (40.1%)	1.12 (0.89–1.41)	.31
White	50/969 (5.2%)	46/481 (9.6%)	0.52 (0.33–0.79)	.001
Uninsured	305/973 (31.3%)	223/487 (45.8%)	0.54 (0.43–0.68)	<.001
Married	309/962 (32.1%)	197/476 (41.4%)	0.67 (0.53–0.85)	<.001
Never married	413/647 (63.8%)	187/274 (68.2%)	0.82 (0.59–1.12)	.20
Homeless	8/972 (0.8%)	19/487 (3.9%)	0.20 (0.08–0.50)	<.001
Ever incarcerated†	24/371 (6.5%)	49/180 (27.2%)	0.18 (0.11–0.32)	<.001
Mean age ± SD	34.2 ± 14.3	36.9 ± 13.8	N/A	<.001
Received blood products	93/957 (9.7%)	35/468 (7.5%)	1.33 (0.87–2.04)	.17
IDU	13/957 (1.4%)	24/476 (5.0%)	0.26 (0.12–0.54)	<.001
Crack use	46/955 (4.8%)	69/473 (14.6%)	0.30 (0.20–0.45)	<.001
Same-gender sex	21/950 (2.2%)	24/465 (5.2%)	0.41 (0.22–0.78)	.003
High-risk sex‡	66/951 (6.9%)	45/460 (9.8%)	0.69 (0.45–1.04)	.06
Sex with prostitute	5/940 (0.5%)	104/466 (22.3%)	0.02 (0.01–0.05)	<.001
Worked as prostitute	17/939 (1.8%)	14/460 (3.0%)	0.59 (0.27–1.27)	.14
Gonorrhea	93/954 (9.7%)	129/466 (27.7%)	0.28 (0.21–0.38)	<.001
Syphilis	38/955 (4.0%)	36/467 (7.7%)	0.50 (0.30–0.81)	.003
Genital herpes	14/957 (1.5%)	11/468 (2.4%)	0.62 (0.26–1.47)	.23
Chlamydia	78/952 (8.2%)	15/466 (3.2%)	2.70 (1.49–5.00)	<.001
Genital warts	26/958 (2.7%)	6/466 (1.3%)	2.13 (0.83–5.88)	.09
Mean number of sexual partners in past year ± SD	1.37 ± 3.57	2.58 ± 7.38	N/A	<.001
Regular sex partner had other sex partner(s) in past year†	40/267 (15.0%)	4/87 (4.6%)	3.70 (1.20–12.5)	.01

OR = odds ratio; 95% CI = 95% confidence intervals; SD = standard deviations; IDU = injection drug use; N/A = not applicable.

*For sexual risk behaviors, drug-associated risk behaviors, sexually transmitted diseases, and transfusion, any positive history, regardless of date, was considered positive.

†Information pertaining to incarceration and sexual contacts of respondents' regular partners was collected only during the last third of the study after an interim modification of the standardized interview. The question regarding the latter topic was only asked of respondents claiming one sexual partner in the past year.

‡Includes any history of sexual contact with an injection drug user, a bisexual male (female respondents only), or an individual with known HIV infection.

drugs. When the univariate analysis was repeated including all 1,744 patients who were interviewed, the results were unchanged except for the finding of a significant association between male gender and history of high-risk sex (defined as sexual contact with an injection drug user, an individual with known HIV infection, or a bisexual male [female respondents only]) and genital herpes.

A multivariate analysis of factors that were independently associated with gender in the study population is shown in Table II. In the logistic regression model, females were less likely than males to report injection drug or crack use, homelessness, same-gender sex, or sexual contact with a prostitute. A history of sexually transmitted disease was less common among women, but this difference was statistically significant only among women 35 years of age and older.

DISCUSSION

The dramatic rise in HIV infection rates among women in the US has been the object of increasing concern. The Centers for Disease Control and Prevention reported that, in 1994, the northeastern US led the country in new AIDS cases among women, with 98.6% occurring in urban centers.[1] In New York City, the proportion of AIDS cases diagnosed among women increased from 9% to 28% between 1981 and 1994.[18] An understanding of the behaviors that put individuals of each gender at risk is crucial in best directing HIV preventive services.

The present study reports high rates of self-reported HIV risk behaviors in a population of adult, noncritical, medical emergency department patients in an HIV epicenter. Rates of almost all drug-related and sex-related risk behaviors were higher in males compared to females. Prior studies have also shown increased rates of drug use[19] and sexual risk behaviors[7,20] among males compared

TABLE II Multivariate Logistic Regression Analysis of Factors with Significant Gender Association

Variable	OR_{adj} (95% CI) for Females*
Homeless	0.28 (0.10–0.78)
Injection drug use	0.37 (0.17–0.82)
Crack use	0.34 (0.21–0.57)
Same-gender sex	0.39 (0.23–0.73)
Contact with a prostitute	0.02 (0.01–0.06)
Any STD†	
Age < 35	0.80 (0.57–1.15)
Age ≥ 35	0.23 (0.15–0.36)

OR_{adj} = adjusted odds ratio; 95% CI = 95% confidence interval.

*The reference group is male subjects.

†Any STD (sexually transmitted disease) includes any reported history of syphilis, gonorrhea, chlamydia, genital herpes simplex, or genital warts. An interaction was found for age and gender that was included in the model.

to females. The higher rate of prior chlamydial infections in women may be related to a greater frequency of routine testing and greater sensitivity of certain testing techniques in the female population.[21] When only the drug-using subjects were analyzed, the male preponderance of risk behaviors disappeared, and there was a tendency toward higher rates of sexual risk taking among females. This observation is in concordance with a number of studies that have noted a close association between drug use, especially crack use, and HIV risk and infection among women in the inner cities.[10,22]

Among patients who reported a single sexual partner in the past year, a group likely to be classified as "low risk," women were significantly more likely than men to report that their solitary partners had sex with others. This correlates well with prior observations that women diagnosed with HIV infection who deny all risk behaviors often reveal specific high-risk heterosexual contact on closer questioning[23,24] and may explain the high proportion of HIV-infected women not belonging to traditional HIV risk categories described in previous publications.[1,15]

The growth of the HIV epidemic among women, particularly women of color in urban centers, is of grave concern. Women who engage in specific HIV risk behaviors may be at greater risk for HIV infection than men participating in the same behaviors. This phenomenon has been demonstrated for injection drug use,[25] crack use,[10] and heterosexual risk behaviors.[26] There may be several factors contributing to this observation, including gender-based differences in frequencies of sexual relationships with injection drug users, anatomically or physiologically based differences in the likelihood of sexual transmission of the virus, and complex issues of independence and self-empowerment, which often work to the disadvantage of women. In addition to the tragic personal toll that HIV infection takes among these women, the fact that most infections occur during the childbearing years has resulted in increases in pediatric AIDS cases, as well as increases in the numbers of uninfected children left orphaned by the HIV epidemic.[27]

Numerous studies have documented the effectiveness of programs aimed at increasing awareness in order to decrease behaviors associated with HIV transmission. These strategies have led to risk reduction and decreased HIV incidence in the injection drug–using[28] and male homosexual communities.[29] Rising rates of HIV prevalence suggest that these interventions have been less effective among women. In addition to intensifying educational messages directed toward women, efforts to decrease the spread of HIV within the female

population must be mindful of the complex interplay of drug use, sexual risk behaviors, and culture, as well as issues of dependence, fear of violence, and self-empowerment.[30]

Although a sample of patients visiting an adult medical emergency department may not be an accurate cross section of the community at large, it includes important segments of the population that are difficult to survey in other study settings, such as the uninsured, homeless, intoxicated, and incarcerated. These poorly studied groups are particularly relevant to the HIV epidemic, given the high rates of HIV acquisition and transmission that prevail within them. Some authors have suggested the urban emergency department as a possible site to reach members of these epidemiologically hidden populations.[31]

The present study had the advantage of having been conducted in an HIV epicenter in a population of patients that was not *a priori* selected for HIV risk behaviors. It also had the advantage of almost complete participation, probably because the interview was incorporated into the process of taking the medical history. Surveys designed to be representative of the overall population seldom achieve participation rates of greater than 80% and generally exclude many of these "hidden" populations by virtue of their enrollment strategies.[5-7] In a population of noncritical adult medical emergency department patients who were not preselected for HIV risk behaviors, we found high rates of HIV risk behaviors in general, with males reporting higher rates of most behaviors. In drug users, however, rates of risk behaviors among females were similar to those among males, and this observation was driven by a female sample that was predominantly African-American.

Certain limitations of this study require mention. Patients were seen mostly during evening and weekend tours, and these patients may be different from the overall emergency department population, although a comparison of the demographic characteristics of the two groups demonstrated only minor differences. The patients were predominantly females from ethnic minority groups, whereas their interviewers were all white male physicians. It is possible that higher rates of reported HIV risk behaviors among men may be explained partially by an increased willingness to admit these behaviors to interviewers of the same gender. Finally, caution should be used in generalizing our findings from one inner-city emergency department to all emergency departments, to other urban areas, or to the general population.

The present study demonstrated significant gender-based differences in HIV risk behaviors in a sizable sample of urban emergency department patients who were not preselected for HIV risk. Such analyses of differences in risk behavior

profiles between the two genders may help guide the appropriate allocation of public health resources in the inner cities. It is clear that HIV counseling, testing, and preventive services need to be sensitive to the differences between the genders and to the integral roles that ethnicity and drug use play in determining the risk behavior profiles of both men and women. These efforts must also pay heed to "low-risk" monogamous women who may be involved in sexual relationships with nonmonogamous partners. The high rates of reported HIV risk behaviors in all groups emphasize the urgent need for continued efforts in providing and improving such services.

REFERENCES

1. Centers for Disease Control and Prevention. Update: AIDS among women—United States, 1994. *MMWR Morb Mortal Wkly Rep.* 1995;44:81–84.
2. Centers for Disease Control and Prevention. Heterosexually acquired AIDS—United States, 1993. *MMWR Morb Mortal Wkly Rep.* 1994;155–160.
3. Holmberg SD. The estimated prevalence and incidence of HIV in 96 large US metropolitan areas. *Am J Public Health.* 1996;86:642–654.
4. Centers for Disease Control and Prevention. Community-level prevention of human immunodeficiency virus infection among high-risk populations: the AIDS community demonstration projects. *MMWR Morb Mortal Wkly Rep.* 1996;45(RR-6):1–24.
5. Centers for Disease Control and Prevention. Number of sex partners and potential risk of sexual exposure to human immunodeficiency virus. *MMWR Morb Mortal Wkly Rep.* 1988;37:565–568.
6. Catania JA, Coates TJ, Stall R, et al. Prevalence of AIDS-related risk factors and condom use in the United States. *Science.* 1992;258:1101–1106.
7. Peterson JL, Grinstead OA, Golden E, Catania JA, Kegeles S, Coates TJ. Correlates of HIV risk behaviors in black and white San Francisco heterosexuals: the population-based AIDS in Multiethnic Neighborhoods (AMEN) study. *Ethn Dis.* 1992;2:361–370.
8. Joe GW, Simpson DD. HIV risks, gender, and cocaine use among opiate users. *Drug Alcohol Depend.* 1995;37:23–28.
9. Freeman RC, Rodriguez GM, French JF. A comparison of male and female intravenous drug users' risk behaviors for HIV infection. *Am J Drug Alcohol Abuse.* 1994;20:129–157.
10. Edlin BR, Irwin KL, Faruque S, et al. Intersecting epidemics—crack cocaine use and HIV infection among inner-city young adults. *N Engl J Med.* 1994;331:1422–1427.
11. Dwyer R, Richardson D, Ross MW, Wodak A, Miller ME, Gold J. A comparison of HIV risk between women and men who inject drugs. *AIDS Educ Prev.* 1994;6:379–389.
12. Centers for Disease Control and Prevention. Sexual risk behaviors of STD clinic patients before and after Earvin "Magic" Johnson's HIV-infection announcement—Maryland, 1991–1992. *MMWR Morb Mortal Wkly Rep.* 1993;42:45–48.
13. Chiasson MA, Stoneburner RL, Lifson AR, et al. Risk factors for human immunodeficiency virus type 1 (HIV-1) infection in patients at a sexually transmitted disease clinic in New York City. *Am J Epidemiol.* 1990;131:208–220.
14. New York City Department of Health. *AIDS Surveillance Update.* October 1994.
15. Alpert PL, Shuter J, DeShaw MG, Webber MP, Klein RS. Factors associated with unrecognized HIV-1 infection in an inner city emergency department in the Bronx, New York. *Ann Emerg Med.* 1996;28:159–164.
16. Shuter J, Alpert PL, DeShaw MG, Greenberg B, Klein RS. Rates of and factors associated with self-reported prior HIV testing among adult medical patients in an inner city emergency department in the Bronx, New York City. *J Acquir Immune Defic Syndr Hum Retrovirol.* 1997;14:61–66.

17. Hosmer DW, Lemeshow S. *Applied Logistic Regression*. New York: John Wiley and Sons; 1989.
18. New York City Department of Health. *Summary of Reportable Diseases and Conditions, 1994*. New York: New York City Department of Health; 1995;14:12–13.
19. Warner LA, Kessler RC, Hughes M, Anthony JC, Nelson CB. Prevalence and correlates of drug use and dependence in the United States: results from the National Comorbidity Survey. *Arch Gen Psychiatry*. 1995;52:219–229.
20. Neff JA, Burge SK. Alcohol use, liberal/conservative orientations, and ethnicity as predictors of sexual behaviors. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1995;8: 302–311.
21. Stamm WE. Toward control of sexually transmitted chlamydial infections. *Ann Intern Med*. 1993;119:432–4.
22. Joe GW, Simpson DD. HIV risks, gender, and cocaine use among opiate users. *Drug Alcohol Depend*. 1995;37:23–28.
23. Castro KG, Lifson AR, White CR, et al. Investigation of AIDS patients with no previously identified risk factors. *JAMA*. 1988;259:1338–1342.
24. Lindsay MK, Grant J, Peterson HB, Risby J, Williams H, Klein L. Human immunodeficiency virus infection among patients in a gynecology emergency department. *Obstet Gynecol*. 1993;81:1012–1015.
25. McCoy CB, Khoury E. Drug use and the risk of AIDS. *Am Behav Sci*. 1990;33:419–431.
26. O'Brien TR, Busch MP, Donegan E, et al. Heterosexual transmission of human immunodeficiency virus type 1 from transfusion recipients to their sex partners. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1994;7:705–710.
27. Michaels D, Levine C. Estimates of the number of motherless youth orphaned by AIDS in the United States. *JAMA*. 1992;268:3456–3461.
28. Wiebel WW, Jimenez A, Johnson W, et al. Risk behavior and HIV seroincidence among out-of-treatment injection drug users: a four-year prospective study. *J Acquir Immune Defic Syndr Hum Retrovirol*. 1996;12:282–289.
29. Carne CA, Johnson AM, Pearce F, et al. Prevalence of antibodies to human immunodeficiency virus, gonorrhoea rates, and changed sexual behaviour in homosexual men in London. *Lancet*. 1987;1:656–658.
30. du Guerny J, Sjoberg E. Inter-relationship between gender relations and the HIV/AIDS epidemic: some possible considerations for policies and programmes. *AIDS*. 1993;7: 1027–1034.
31. Kelen GD, Hexter DA, Hansen KN, Tang N, Pretorius S, Quinn TC. Trends in human immunodeficiency virus (HIV) infection among a patient population of an inner-city emergency department: implications for emergency department-based screening programs for HIV infection. *Clin Infect Dis*. 1995;21:867–875.